STATE OF ILLINOIS
ENVIRONMENTAL PROTECTION AGENCY

INTER-OFFICE CORRESPONDENCE

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Sauget

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JUL 26 1971
ENVIRONMENTAL PROTECTION AGENCY
STATE OF ILLINOIS

DATE: July 22, 1971

MEMO TO: W. H. Busch, Facilities Certification Section

FROM: M. G. Neumann, Engineer, Mississippi Basin

SUBJECT: FEDERAL SEWAGE WORKS GRANT - SAUGET - WPC - ILL-264

In reference to your memo of May 10, 1971, the following information has been compiled by this office regarding the phenol content of the plant effluent and its effect on the Mississippi River; the effectiveness of the sludge lagoons to concentrate the solids; and the lagoons effect on ground water contamination.

Attachment 1 contains the theoretical calculations of the allowable phenol discharge from Sauget, a summary sheet containing the results of the sampling that was done, copies of the laboratory analysis sheets, and copies of Sauget's operation reports.

Assuming dilution by the total flow of the Mississippi past the outlet, the maximum allowable average phenol discharge would be 9.12ppm. Sauget has been averaging 6-8ppm this year. The summary sheet indicates that phenol can sometimes be found in the river, but that no noticeable increase in the phenol content of the river can be attributed to the discharge from Sauget after initial dilution. Sample results obtained by Mr. E. C. Bennett were not included, because in November 1970, the Phenol Manufacturing Dept. at Monsanto ceased operations, decreasing Monsanto's phenol discharge by 30%.

On June 17, 1971, an inspection of the sludge lagoons was conducted. Pictures of the lagoons are on Attachment 2. The perimeters were checked for leakage. None could be found. There are four lagoons, running east to west and numbered one through four. Plant personnel had ceased pumping to Lagoon #1 last summer. Almost all of the liquid had evaporated. Lagoon #2 has not yet been used. Pumping had ceased to Lagoon #3 last August. However, there was a coating of oil on the surface, which was inhibiting the evaporation of the liquid. Lagoon #4 was in normal operation. Sludge was being pumped into the lagoon and the liquid was evaporating. To check for ground water contamination, water from a well located 100 yards from the lagoons and 80 feet deep was analyzed for phenol. The analysis results of 200ppb show that some contamination with phenol is occurring. The analysis sheet is attached.

Also attached is previous correspondence regarding the Federal Sewage Works Grant.

If you have any further questions, please advise.

Michael G. Neumann

MGN/cas
attach

EVERY INTER-OFFICE LETTER SHOULD HAVE A SUBJECT. WRITE ON ONLY ONE SUBJECT IN THIS LETTER.
ALL LETTERS TO BE SIGNED . . . NO SALUTATION OR COMPLIMENTARY CLOSING NECESSARY.

cc: DWPC - Surveillance
EPA-90-8/70 cc: Mississippi Basin

SCREENED

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Sauget

ATTACHMENT 1

1. Assume Sauget's average daily flow = 26 MGD.

2. Assume effluent diluted by 100% of river flow past outlet.

Daily flow of Mississippi River = $183{,}767 \frac{\text{cu.ft.}}{\text{sec.}} \times 60 \frac{\text{sec.}}{\text{min.}} \times 1{,}440 \frac{\text{min.}}{\text{day}} \times 7.48 \frac{\text{gal.}}{\text{cu.ft.}}$

$= 118{,}600$ MGD

Max. permissible phenol level in river = 5ppb and average 2ppb

Max. allowable phenol discharge = $\frac{5 \text{ parts}}{10 \text{ parts}} \times 118.600 \times 10^9 \frac{\text{gal.}}{\text{day}} \times 8.34 \frac{\#}{\text{gal.} H_2O} = 4{,}950 \frac{\#\text{phenol}}{\text{day}}$

Or Sauget's effluent concentrate may not exceed.

$\frac{5 \text{ parts}}{10^9 \text{ parts}} \times 118.600 \times 10^9 \frac{\text{gal.}}{\text{day}} \times \frac{\text{day}}{26 \times 10^6 \text{ gal.}} = 22.80 \times 10^{-6} = 22.80 \text{ ppm}$

Using average permissible river level of 2ppb:

Max. allowable average phenol discharge =

$\frac{2 \text{ parts}}{10^9 \text{ parts}} \times 118.6 \times 10^9 \frac{\text{gal.}}{\text{day}} \times 8.34 \frac{\#}{\text{gal } H_2O} = 1{,}980 \frac{\#\text{ phenol}}{\text{day}}$

Or Sauget's effluent concentrate may not average above.

$\frac{2 \text{ parts}}{10^9 \text{ parts}} \times 118.6 \times 10^9 \frac{\text{gal.}}{\text{day}} \times \frac{\text{day}}{26 \times 10^6 \text{ gal.}} = 9.12 \times 10^{-6} = 9.12 \text{ ppm}$

SUMMARY

Maximum allowable phenol level in river = 5ppb
Maximum allowable phenol discharge from Sauget = $4{,}950 \frac{\#\text{ phenol}}{\text{day}}$
Maximum allowable phenol concentrate from Sauget = 22.8 ppm

Maximum allowable average phenol level in river = 2ppb
Maximum allowable average phenol discharge from Sauget = $1{,}980 \frac{\#\text{ phenol}}{\text{day}}$
Maximum allowable average phenol concentrate from Sauget = 9.12 ppm

PHENOL ANALYSIS SUMMARY SHEET

SAMPLING POINT	PHENOL CONTENT, ppb
1. 1,500' N. of Sauget outlet	5
2. " " " "	0
3. " " " "	0
4. 600' S. of Sauget outlet	0
5. " " " "	0
6. " " " "	0
7. 1 mile S. of Sauget outlet	6
8. " " " "	0
9. " " " "	0
10. 9.5 miles S. of Sauget outlet	0
11. 7 hr. composite sample of Sauget STP effluent	3,000
12. From a well located 100 yards from sludge lagoons and 80 feet deep	200